2007-05881/

Updated:
January 28, 1997

NSERC Contact

Volume 21, No. 3
Winter 1996

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NSERC's Most Strategic Investment

Canadians are becoming very conscious of demographics. A popular book on demographics has become a Canadian best seller. Politicians debate the impact of an aging population on the future of the Canada Pension Plan. And Canadian students are finding that many senior professors have retired, or taken early retirement, and disappeared from university lecture halls.

Demographics also has inevitable and profound impli-cations for science and technology in Canada. It is becoming evident that the country's capabilities in science and technology at the dawn of the new millennium will depend very much on today's graduate students, postdoctoral fellows and junior faculty. The extent to which they succeed will determine the health of the entire enterprise. Helping them launch their research careers and keeping them in Canada poses a major challenge for NSERC. The challenge is all the greater because it must be met within constrained resources and at a time of great uncertainty and change in the universities and in industry.

Nevertheless, this is the most **strategic** of all investments that NSERC can make in Canada's capabilities in science and technology, and that means that Council must be strongly focused on meeting the needs of the new generation of Canadian researchers.

To discuss how best to do this, NSERC held a working meeting in Ottawa over the first weekend of October. The 30 invited participants included graduate students, postdoctoral fellows, junior faculty, two young researchers from industry, Council members and members of NSERC's grant selection (GSC) and policy committees. Members of NSERC senior staff and I also took part.

Working in focus groups, with professional facilitators, the participants developed recommendations to NSERC, to the universities, to government, and to the young researchers themselves as a group. They ranked the recommendations according to impact: high, medium, or low, and according to ease of implementation: easy, hard, and very hard. The time required to effect the change represented a third dimension.

Some of the easy things for NSERC to do that might have a high impact were:

- sensitize GSCs to take into account issues facing junior faculty members who are trying to establish themselves;
- ensure GSCs consider other (e.g. non-academic) experience of the applicants and the training of students for industrial careers as relevant in evaluating grant applications;
- remind GSC members that they are ambassadors for NSERC and suggest that they can be proactive in educating new researchers about the granting process at their own universities;
- make it an explicit purpose of site visits to help junior faculty.

At the other extreme, a very difficult challenge arises in providing new faculty with the resources to get started in their research, at a time when NSERC and many universities are having to cope with budget cuts. This situation is exacerbated by the high teaching load that junior faculty must carry at the same time they compete for research grants with their senior colleagues, some of whom have taken early retirement and are now able to spend most of their time on research. Many measures will have to be explored in addressing this issue, both at NSERC and at the universities, and I don't think that any of them will be easy or quick.

It also became clear during the workshop that an academic career is no longer the dominant option for many young Ph.D.s. However, in many ways the postgraduate education system still treats it as the only career for which graduate students are being prepared. This raised many questions about university-industry relations, for example, industry attitudes to postgraduates.

Participants felt that industry must abandon the view that Ph.D.s are qualified only to pursue research emerging from their theses and, correspondingly, Ph.D. students and their supervisors should have

broader expectations. Industrial recruiters need to look at Ph.D.s as extraordinarily skilled problem solvers, who know the value of knowledge and where to find it, who understand its limitations and are aware of its trends, and who have demonstrated the ability to generate it as needed -- and universities should also begin to see Ph.D. studies in that light. This raises questions about the difference between advanced education **in** research and advanced education **for** research.

Another question raised was the duration of Ph.D. studies. For example, in areas of fast-moving technology, industry is expressing a growing preference for people with a Master's degree, who become available for employment much more quickly. Such questions need to be explored in depth by the universities, by industry, and by NSERC.

One theme that appeared throughout the Workshop discussions was the need to raise awareness among the general public about the value and importance of research in the natural sciences and engineering. The general recommendation was addressed to everyone: NSERC, universities, government and young researchers, but no really new ideas emerged. The suggested measures were all things that are already being tried. Clearly, this is still an unmet challenge for the entire Canadian NSE research community.

Will this Workshop make a difference? I expect it to. NSERC, for one, will do all that it can. We have started already. Charles Levert, a doctoral student, and Cheryl Wellington, a postdoctoral fellow, have already been appointed to the Committee on Research Grants. Jean St-Pierre, a senior engineering scientist with Ballard Power Systems (and a former NSERC Industrial Research Fellow), and David Woodfine, a doctoral student at Trent University, have been appointed to the Committee on Scholarships and Fellowships. All have attended their first meeting as committee members and brought important new perspectives to the discussions.

NSERC staff are looking at the feasibility of implementing the recommendations that were addressed to us. We are also figuring out what to do with the recommendations made to others universities, government, and the young researchers themselves so that they might lead to constructive action.

Finally, I think there is a need for at least one more workshop. Many questions were raised about the involvement of young Canadian researchers in industry, and they have to be explored with a group of people who are personally familiar with that sector.

Tom Brzustowski
President

Canadian Light Source Proposal Endorsed

At its October meeting, Council endorsed a proposal for a

national synchrotron light source to be located at the Saskatchewan Accelerator Laboratory of the University of Saskatchewan. Since 1993, NSERC has provided support to the Canadian Institute for Synchrotron Radiation (CISR) to prepare a proposal for a synchrotron that would fit the needs of the majority of current and potential Canadian synchrotron users. NSERC also arranged for an independent, international, peer review of this proposal, with advice to the CISR on site selection.

The proposed Canadian Light Source is a research tool that would serve a very wide range of disciplines, for both academic and industrial research.

Since the discussion of this item at the June meeting, a lot of staff work had been done. As a final step in preparation for Council's discussion of this item, a delegation of Council members visited the proposed site for the facility in early October and met with the proponents to probe a number of issues including the budget and project timetable and the sources of funding for construction and operation.

Following a thorough review of the material presented, Council unanimously adopted the following resolution:

1. NSERC endorses the proposal from the University of Saskatchewan to meet Canada's need for a source of synchrotron light by constructing and operating the national facility called the Canadian Light Source (CLS) in Saskatoon.
2. NSERC recognizes that the increased research activity resulting from the availability of the CLS will significantly increase the demand for NSERC research support from the many disciplines that use synchrotron light in their research. NSERC will deal with that funding pressure within its current budget and through its existing programs.
3. NSERC has no capacity for funding the construction and operation of the CLS facility. For the project to proceed, $77.4 million in capital and $7.3 million in annual operating costs (both amounts in 1995 dollars) must be found elsewhere. However, NSERC is ready to offer its good offices, particularly its capability to carry out scientific due diligence, to assist in the effective implementation of the CLS project.

NSERC's Committees

Committees play a central role at NSERC, so it is important that the individuals who serve on them are selected with care. Over the years, NSERC has been fortunate to recruit for its committees excellent people who give generously of their time to serve the community, and the Council deeply appreciates the commitment, dedication and high quality advice provided by these individuals. How are NSERC committee members chosen and how can you help? Just read on!

The Council is NSERC's governing body and is composed of a full-time president and up to 21 members. Selected for their leadership in the research, business, and academic communities, the members are part-time office holders appointed by the Governor-in-Council for terms of up to three years. The committee structure adopted by the Council, shown schematically opposite allows it to devote most of its deliberations to broad policies and financial issues.

The Council manages its grants and scholarships programs with advice from **standing committees**. These committees provide guidance on specific policies and programs under their purview and, where appropriate, oversee the work of selection committees/panels, in accordance with specific decisions and any other guidelines provided by Council. **Selection committees** are responsible for recommending awards within policies, budgets, guidelines and criteria provided by standing committees and Council.

Appointment Process

The **standing committees** are chaired by a member of the Council and are composed of both Council and non-Council members. The membership slates are developed by the Directors General, taking into account the suggestions received from various sources, including individual researchers. The final recommendations are sent to the Corporate Secretary who consults with the President prior to giving the final approval.

The membership slates of **selection committees**, are drawn up by NSERC's Program Officers, based on the suggestions of current members of the selection committees, the nominations received from external sources during the past three years, and close consultation with such individuals as Group Chairs, current and past selection committee chairs, and external advisers. The suggestions put forward by the selection committees are very important because the members of these committees are in the best position to see the evolution occurring within their own discipline and the expertise required to assess the proposals. The suggestions received from several sources are, of course, a valuable tool to the committees when preparing their membership report. The final slates are reviewed and endorsed by each appropriate Director General, Director and Team Leader, as required, before they are forwarded to the Corporate Secretary for final approval. Given that the quality of peer review is directly related to the quality of the membership, this is a very important task.

Guidelines Governing Membership of Selection Committees/Panels

Guidelines governing the appointment of all committees, and the current membership, can be found on NSERC's Web site. They are also available upon request from the Secretariat Division by electronic mail (lfm@nserc.ca), by telephone (613- 996-7559) or by fax (613-943-0742).

Nominations

You are invited to send your membership suggestions to NSERC. Nominees should be individuals who are known and respected for their capabilities, who know and understand Canadian university-based research, who display both breadth and depth of understanding and knowledge in their field and beyond, who exercise good judgement, and who are able to recognize value to Canada as a whole. Nominations are retained in NSERC's bank of potential committee members for three years.

At its June 1996 meeting, Council reviewed and approved a proposal put forth in the Report of the Women's Task Force to ensure greater participation of women and young researchers on NSERC's standing and selection committees. You are therefore strongly encouraged to suggest individuals from these categories for membership. For standing committees, the Council is particularly interested in the names of postgraduate students and postdoctoral fellows who could provide important input into NSERC policy and program development.

Nominations are normally submitted on Form 250, "Nomination of Members for NSERC Committees." This form is currently being revised, but will be available in the new year on NSERC's Web site as a postscript file (i.e., you can print the form, then complete and return it to NSERC). The form will also be available upon request from the Secretariat Division.

Integrity in Research: the Peer Review System

> *As a public service, NSERC reports on serious cases of misconduct and on the sanctions that are taken as a result of investigations by the NSERC Committee on Professional and Scientific Integrity. In accordance with the federal Privacy Act, NSERC does not disclose the identity of an individual subjected to sanctions.*

NSERC staff identified an application submitted by a researcher from a Canadian university that appeared to contain extracts from a proposal the person had reviewed as an external referee under an NSERC program. The matter was referred to the university, which investigated and concluded that the researcher was guilty of gross misconduct.

NSERC's Committee on Professional and Scientific Integrity (CPSI) reviewed this case and agreed with the university's conclusion. The CPSI viewed this as an extremely serious act undermining the integrity of the peer review system. Such a breach of the confidentiality of the peer review poses a threat to the Councils' evaluation system, which is based on the integrity of the peers. The CPSI therefore recommended to the President of NSERC that the researcher be barred indefinitely from participating in the peer review process as a reviewer or committee member and also be barred from applying for grants for a period of five years. These sanctions

were approved by the President and are in effect.

Update on the Research Grants Reallocations

Details on the Research Grants Reallocations Exercise were distributed to the research community in mid-July and posted on NSERC's Web site. Presentations on the process were made during NSERC's fall site visits.

The purpose of the exercise is to determine where funds could be most valuably reinvested among the disciplines supported by the Research Grants Program in the context of the Program objectives. As much as 10% of the Program's total funding will be redistributed in response to arguments made by the various disciplines.

In their submissions, disciplines must explain why it is important for Canada that their research community receive additional funds at the expense of research in other fields. The resultant changes to Grant Selection Committee (GSC) budgets will be implemented over a period of four years, beginning with the 1999 competition.

NSERC will use information assembled in the Reallocations Exercise to communicate the important achievements, opportunities and challenges of university research to Canadian governments, industry and the general public. The Council believes that a broad and effective communication of the results and benefits of university research will lead to greater recognition of its importance to the nation, and higher priority for public funding.

In almost all discipline areas, steering committees (see above Web page for membership) have already been established. All steering committees cover one or two GSCs. They have been encouraged to consult broadly with individual researchers, as well as GSCs and appropriate societies and bodies.

In November, the steering committees provided NSERC with membership suggestions for the Reallocations Committee. The appointments will be made at the Council's meeting in January. The membership will be published on the Web page.

Answers to commonly asked questions about the exercise and the lists of the societies and organizations the steering committees plan to consult will be posted in the new year. You are encouraged to check the site regularly in order to stay abreast of the most recent developments.

Update: Code of Conduct for Research Involving Humans

In March, MRC, NSERC and SSHRC published a comprehensive draft of a new Code of Conduct for Research Involving Humans. Over 15,000 copies of the draft document have been distributed, and many of the approximately 250 responses were thoughtful and constructive and will improve the document.

As many respondents suggested that the timetable for responses was too brief, the Councils agreed that more time would be allowed for comments and the preparation of the final document. The development of the Code will therefore continue until March 1997, and a final document will be presented to the Councils by April 1997.

Those interested in contributing to the revision process should consult the following Web site: http://www.ethics.ubc.ca.

Strategic Project Grants: 1996 Competition

This year's Strategic Project Grants competition was the first following the restructuring of NSERC's partnership programs in January 1996.

The Strategic Projects element of the Research Partnerships Program (RPP) provides funding for research projects that involve the active participation of partners from outside the academic sector. While proposals may involve any area of research with the potential for benefit to Canada, Strategic Project Grants also provide a mechanism for accelerating research in six target technology areas.

NSERC's funding will total $9.6 million in the first year. The average award was $89,719. Table 1 provides a summary of the awards, by area.

Table 1. Strategic Project Grants Competition Summary

	Number of		Success	Total (millions of $)		Funding
Area	**Appl.**	**Awards**	**Rate (%)**	**Requested**	**Awarded**	**Rate (%)**
General Areas	75	10	13.3	7.5	0.9	12.1
Targeted Areas						
Biotechnologies	104	29	27.9	10.8	2.6	24.4
Energy Efficiency Tech.	23	4	17.4	1.7	0.3	19.9
Environmental Tech.	91	24	26.4	10.1	2.4	24.1
Information Tech.	41	9	21.9	4.9	0.8	17.0
Mfg. and Processing	25	9	36.0	2.4	0.7	28.6

Tech.						
Materials Tech.	54	22	40.7	5.5	1.8	32.3
Total	413	107	25.9	42.9	9.6	22.4

Partnerships and Interactions

As part of the selection criteria, NSERC asks the selection panels to evaluate the level of participation of the partners in the project. While it is not mandatory for partners to provide cash support, in many cases it is seen as appropriate given the type of project proposed. The award breakdown by type of partner is as follows:

Number of industrial partners	169
Number of government partners	75
Total number of partners	244

Over the lifespan of the projects funded this year, the level of contribution (in millions of $) by the partners will be:

NSERC investment	$30.5
Investment from industrial partners	2.2
Investment from government partners	1.7
In-kind contributions from partners	12.0
Levered from partners	52.3%

Strategic Project Grants have proven highly attractive to small and medium-sized companies (SMEs): half of the industrial partners involved in this year's successful projects are SMEs.

Quality of Applications: Panel Comments

The Strategic Projects selection panels evaluated the applications using the RPP selection criteria: merit of the research proposal; interactions and partnerships; training; management and budget. Although the panels were pleased with the overall quality of the

applications, they noted that applicants consistently failed to address certain key criteria in their proposals. Based on these deficiencies, the following suggestions are made in order to improve proposals and make them more competitive.

Merit of the Research Proposal

- It is important to clearly explain any potential overlap in funding between the proposed project and the currently funded grants and contracts.
- The proposals are enhanced by a comprehensive literature review in support of the proposed research.
- Applicants and partners must clearly explain the benefits to Canada of the proposed research.

Interactions and Partnerships

- Supporting letters need detail in order for panels to ascertain the true level of the partner's commitment (in particular, partners need to indicate more precisely how they would exploit the research results).
- The proposals should contain a communication plan for disseminating the results.

Training

- Students should not appear only as a budget item. Successful applicants indicate the role of students in the project and who will be providing the supervision.

Management and Budgeting

- It is essential that applicants describe their time commitment to the project, in relation to their commitments to their other research. Panels will use the information to determine the feasibility of the project.
- The budgets need to be realistic, and well justified in terms of achieving objectives.
- For larger projects, applicants must explain how the various team members and partners will communicate and interact.

Strategic Project Grants Competition Highlights

The following projects are selected examples of highly rated proposals funded in the 1996-97 Strategic Project Grants competition.

Development of Magnetic Refrigeration of the Liquefaction of Natural Gas

John A. Barclay, Department of Mechanical Engineering,

University of Victoria

The use of natural gas as an alternative vehicle fuel is driven by the environmental need for a lower cost fuel and by the geopolitical advantage of exploiting a fuel for which Canada has an abundant domestic supply. However, various barriers impede the widespread introduction of natural gas into the transportation market. One of the more important of these is the high capital and operating cost of currently available refuelling infrastructures that are based on existing liquefied natural gas (LNG) technology. The relatively high cost of LNG results in part from the need to refrigerate natural gas down to its liquid action temperature.

The Cryofuel System (CFS) group at the University of Victoria was created with the premise that new technology was needed to overcome this cost barrier. The research focus has been on the development of inexpensive refuelling systems based on more efficient and less expensive small-scale liquefiers for natural gas. A technology that has the potential for superior performance is magnetic refrigeration, an undeveloped technology that is currently being undertaken by the CFS group.

This proposal excelled in all four selection criteria, demonstrating a very interesting and innovative, high risk approach to developing an inexpensive refuelling system. The candidate clearly described his plan to manage the research in an effective and efficient manner with an ability and willingness to work with others in order to avoid unnecessary duplication of effort or training and to maximize the benefits with as few dollars as possible. The training component is clearly detailed and well thought out and includes courses and seminars from both the university and industry forums.

The proposal also included a plan detailing the strong 'active' involvement, beyond a monetary contribution, of the partner, Westcoast Energy. This plan includes regular visits by the partner with the research group, and the partner reviewing quarterly reports and providing business input relevant to commercial applications and market requirements for the technology being developed. Such involvement clearly indicates their commitment to the project. In-kind contributions of the partial time of two scientific researchers to the project and a well focused supporting letter further re-iterate the commitment to this project by Westcoast Energy.

Electroluminescent Oxide Powder Phosphors

Adrian H. Kitai, Materials Science and Engineering, McMaster University

This research project is the continuation of a research effort started in 1994, when Dr. Kitai was awarded a 3-year, $179,000 strategic grant to develop colour thin film sputtered phosphors for electroluminescent devices in flat panel displays. The project had the support of Sherritt Inc., Luxell Technologies Inc., and Quantaflex Canada Inc., manufacturers of advanced industrial materials, flat panel displays, electroluminescent lamps, film heaters and special assemblies of these products.

Several colour phosphor compounds with commercially significant performance in the red, green and blue parts of the spectrum have been achieved. International patent protection has been sought for Dr. Kitai's most recent discoveries in the EL display area. The research effort will continue for an additional 3 years to refine the technology, especially the development of colour phosphors compounds with higher lifetime and brightness and full colour capability, that are stable at low and high temperatures (-60°C to 100°C) and inherently moisture insensitive.

In 1996, the market for flat panel EL displays will reach approximately $200 million. Development of colour phosphor thin films with the characteristics described above will give Canada colour panel supply capability, and Canadian users who manufacture and export systems built around these panels competitive advantage. The three Canadian companies that continue to support the research effort are entering pilot production of EL panels, or are producing them now. However, they have been hampered by inadequate performance of existing commercial products (no colour, not bright enough), and actively seek to upgrade them. In collaboration with Dr. Kitai, these barriers may be overcome sooner rather than later.

Modeling Biological and Silvicultural Factors Affecting Sapling Growth and Survival in Managed Birch-Beech-Sugar Maple Stands

Christian Messier, Department of Biological Sciences, University of Quebec at Montreal

Dr. Messier and his interdisciplinary team comprised of researchers from the University of Quebec at Montreal, McGill, Concordia, and Helsinki University propose to examine the growth and survival of northern hardwood tree species under different woodcutting regimes and to model these processes.

In collaboration with GESTOFOR Inc., La Forêt modèle du Bas-Saint-Laurent and the Quebec Ministry of Natural Resources, the team will attempt to quantify how well trees grow in gaps of different sizes. In order to acquire this data, the team will adapt an existing model called LIGNUM to predict sapling growth and survival under different light, fertilization and herbivory regimes. All the major factors important to understanding sapling growth such as light intensity, biomass allocation, crown architecture, root growth and mycorrhizal biology, will be examined.

This project is both biologically interesting and economically important in that it will help define new guidelines for the partial cutting system in the birch-beech-sugar-maple forests. These improved guidelines will help private woodlot associations and the industry better manage the hardwood resource. The research is aimed at supplying the user communities with sound data and methods on which to base silviculture of yellow birch and sugar maple in different types of cuttings.

Research Partnerships Agreements 1996 Competition Results

Two of NSERC's partners recently announced the results of their 1996 competition under the Research Partnerships Agreements with Canadian Government Departments and Agencies.

Department of National Defence

The Department of National Defence (DND)/NSERC Research Partnerships Program held its first competition in June 1996. Even with the short deadline for response, 21 proposals requesting $1.5 million were received. Based upon external reviews and recommendations from the Strategic Projects selection panels, 7 projects will be funded for a total of $444,000 in year one.

Dr. Ronald K. O'Dor's research on Radio-Acoustic Positioning (RAP) systems highlights the quality of the funded proposals. RAP is a rapidly advancing technology for underwater tracking with a wide range of scientific and military applications. The key elements in RAP systems are sonobuoys which detect underwater sounds, process them and relay information about them by radio to a base computer that calculates and displays the positions of the sounds from their arrival times and decodes other information from the signal. In collaboration with VEMCO and the Defence and Civil Institute of Environmental Medicine, Dr. O'Dor will be improving and adapting the system to make buoys self-locating and allow direct reading of the latitude and longitude of tracked object positions. Improving methods of video surveys of benthic flora and fauna, increasing buoy battery life and increasing the capacity for information flow to buoys and mobile units are just a few of the other aspects that the project will look at.

The 1997 competition deadline will be April 15. Please refer to the DND/NSERC Program Description **to be posted on NSERC's Web site in the new year.**

National Research Council

Forty-seven applications requesting $5.9 million were received for the June 1996 competition for the National Research Council (NRC)/NSERC Research Partnerships Program. Based upon external reviews and recommendations from the Strategic Projects selection panels, 19 projects totalling $2.1 million in year one were approved for funding by the NRC/NSERC Research Partnerships Program Steering Committee.

Dr. D. Jed Harrison's research project entitled: "A Microchip Separation System for Electrospray Mass Spectrometry" was one of the highly rated proposals. The project, which Dr. Harrison will conduct in collaboration with Pierre Thibault of the Institute of

Biological Sciences of NRC and SCIEX, is centered on the development of microchip systems that perform chemical reactions and separations integrated on-chip, then introduce the samples produced into a specialized mass spectrometer. Particular emphasis is being placed on biotechnology applications. The sensitivity and selectivity of the combined chip-spectrometer approach will be of important benefit in DNA research for the diagnosis of genetic diseases or disease susceptibility, the identification of forensic samples, and the determination of protein and carbohydrate materials of relevance to cancer research. The microchip system will increase the speed of sample throughput to greatly increase the productivity of mass spectrometers coupled to separation systems.

The 1997 competition deadline will be April 15. Please refer to the NRC/NSERC Program Description **to be posted on NSERC's Web site in the new year.**

Other Upcoming Partnerships Competitions

The deadline for 1997 applications in the Agriculture and Agri-Food Canada (AAFC)/NSERC Research Partnership Support Program and the Canadian Forest Service (CFS)/NSERC Research Partnership Program will also be **April 15**. Please refer to the AFC/NSERC and CFS/NSERC Program announcements located on NSERC's Web site.

First Research Network Awards Annouced

The first competition for research networks was held in June 1996. Based upon input from external referees and scientific evaluation committees, and the recommendation of the Research Networks Selection Committee (RNSC), two networks, GLOBEC and GEWEX, will be funded for a total of $6.2 million over four years. The NSERC investment in these networks has levered $3.8 million in cash and in-kind support from partners.

GLOBEC Canada

This network will examine how living marine resources are affected by variability of their physical environment. The network includes university researchers from British Columbia, Dalhousie, Memorial, Laval, UQAR, Victoria, Queen's, and Simon Fraser, as well as Department of Fisheries and Oceans researchers located at various research stations across Canada.

GEWEX

The MacKenzie GEWEX Study is focused on improving our understanding of the water and energy cycle within the Mackenzie River Basin. The study is of interest given the possible impacts of anthropogenic climate change on high latitude ecosystems and socio-economic activities. University researchers from Toronto,

Saskatchewan, McGill, McMaster, Waterloo, York, and INRS-Eau will be leading 12 research projects in collaboration with researchers from Environment Canada.

Program Updates

Given the large number of applications and small budget for networks, the RNSC has recommended that NSERC consolidate the review of research network proposals from a bi-annual competition into one annual competition for 1997. Next year's deadline for submitting a letter of intent for a research network will be **June 1**. Applicants invited to submit a full proposal must meet an October 1 deadline.

The deadline for all 1996 research network letters of intent was August 15 and the successful applicants had until October 1 to submit their full proposals. There are currently 11 research network proposals, requesting over $11 million in the first year, under review in the second competition.

New Look for Address Labels

NSERC has recently adopted a new standard for address labels. Postal delivery data (province, municipality and street) will appear in upper case letters, using abbreviations whenever possible, with no punctuation or accents, and in the official language in which the municipality is registered. All other information (e.g., business name, personal salutation, etc.) will appear in upper and lower case in the language of preference of the recipient. This standard complies with the new Address Standard being developed by a Treasury Board Interdepartmental Working Group and Canada Post for use by the federal government.

The new standard will permit NSERC to better manage the 60,000 addresses in its database and to meet Canada Post's increasingly stringent requirements for large mailers. The Council has also purchased Canada Post's Address Database and will use it to validate all its addresses. NSERC expects that this new standard, coupled with new address validation procedures, will ensure that its mail is delivered quickly and accurately.

Best Practices in R&D Collaboration Honored

Nearly 300 university researchers, university and industry decision-makers, research consortia representatives and government officials took part in the 2nd Annual Symposium on University-Industry R&D Collaboration, held October 29 and 30 in Montreal. The two-day symposium, sponsored by NSERC and The Conference Board of Canada, was designed to

explore ways of making better use of Canada's research and development expertise by fostering university-industry partnerships in research and development to create wealth.

Conference keynote speaker Lionel P. Hurtubise, chairman of Ericsson Communications Inc., told participants that decreased government funding for universities and an increasingly competitive business environment is helping to foster closer ties between universities and industry. "It's not an easy marriage," he said. "We have to deal with issues -- intellectual property rights issues, academic intellectual freedom issues, the need to publish, differing time frames -- on and on." Hurtubise cited the Centre de recherche informatique de Montréal (CRIM) as an example of a `halfway house' between industry and universities that can help to facilitate collaboration between the two communities.

"In an age of continuously shrinking budgets and escalating costs, it's vital that organizations in the private sector remain committed to the higher education of the business leaders and scientists of tomorrow," he said. "With research and development often being hard hit in terms of educational funding, I have long believed that we must be proactive in ensuring that the academic resources and infrastructure needed to drive our industry into the next century are available to upcoming generations."

Other presentations focused on the current state of university-industry R&D in Canada, best practices in university-industry collaboration, intellectual property, financing, and issues and challenges in developing closer ties between universities and industry.

During the symposium, seven universities, 13 companies and a university-industry consortium received awards for best practices in university-industry R&D partnerships. The winners of the second University-Industry Synergy R&D Partnerships Awards competition were selected from more than 70 nominees from across Canada. Each award includes a $10,000 NSERC research grant for the university partner.

Receiving the awards were:

- Alcan International Ltd. and the University of Quebec at Chicoutimi
- Ciment St-Laurent, LPB Poles Inc., Bell Canada, Hydro-Québec, Canadian National, CP Rail and the University of Quebec at Montreal
- Connaught Laboratories Ltd. and McMaster University
- DORSET Industrial Chemicals Ltd. and McMaster University
- Guelph Utility Pole Company Ltd., LPB Poles Inc., Timber Specialties Ltd., the University of New Brunswick and the University of Toronto
- Handy Chemicals Ltd. and the University of Sherbrooke
- QLT PhotoTherapeutics Inc. and the University of British Columbia
- Ontario Centre for Materials Research

"University and industry R&D collaboration is crucial to Canada's ability to create wealth, because it brings together those who create knowledge and those who put knowledge to productive use," said NSERC president Tom Brzustowski. "Partnerships like these are producing real dividends -- new commercial ventures, new employment opportunities and new products and processes that make for a better world. This country could benefit from a lot more activity like this. We hope that others will use these partnerships as models for similar joint ventures."

Conference Board president and CEO James Nininger also had high praise for the partnerships. "These partnerships illustrate how companies can leverage their research capabilities by teaming up with a university," he said. "It's a message we want to share with other entrepreneurs across the country."

The 1997 symposium has been scheduled to take place in Vancouver on October 23 and 24, 1997. Suggestions about topics and speakers for the symposium should be forwarded to Leo Derikx, Director General of the Research Partnerships Program at NSERC.

University-Industry Synergy Publications:

- *Best Practices in University-Industry Technology Partnerships*, a report describing some of the mechanisms and characteristics of successful partnerships based on case studies of best practices, can be obtained from NSERC's Distribution Centre, Tel.: (613) 996-3078, Fax: (613) 992-5337, E-mail: distribution@nserc.ca;
- *R&D Partnerships Awards 1996*, a booklet featuring the award winners, can be obtained from NSERC's Distribution Centre.

Women in Engineering Videos on Sale

The Nortel/NSERC Women in Engineering Chair at the University of New Brunswick has produced three videos. Established in 1989 to encourage the participation of women in engineering, the chair is held by Dr. Monique Frize, who also acts as a role model and contact person.

The purpose of the first video, "Engineering: Design Tomorrow's World," and its French counterpart, "L'ingénierie: Bâtir le monde de demain," is to introduce students in grades seven to twelve to careers in engineering and to encourage them to keep their options open when making high school course selections. The video features women engineers discussing the engineering profession, their chosen fields (chemical, civil, electrical, geological, industrial, marine, and mechanical engineering) and their specific jobs and activities.

The video recently completed, entitled "Women in Engineering: Changing by Degree," features women who are attending graduate school or who have graduate degrees in engineering. Its purpose is

to encourage high school and undergraduate students to consider the graduate school option. The video introduces women role models discussing their own experiences at graduate school and how they feel it has impacted their lives both professionally and personally.

Copies of the videos can be obtained for $24.95 each, plus shipping and handling charges of $5.00 per video, and GST and PST, from:

The Bookstore
University of New Brunswick
P.O. Box 4400
Fredericton, NB E3B 5A3

Orders can also be placed electronically at the following e-mail address: orders@unb.ca.

Research Update

Bitumen extraction focus of oil sands chair

A new NSERC chair at the University of Alberta will rally some of the best minds in the country to work on improving oil sand separation techniques, according to Eric Newell, Chairman, President and CEO of Syncrude, at the chair inauguration. His comment was echoed by federal energy minister, Anne McLellan, who said that improvements in technology are the key to achieving the full economic value of the oil sand resource, and reducing environmental costs. Leader of the new $1.9 million program is one of Canada's most distinguished chemical engineers, Dr. Jacob Masliyah. His long record of collaboration with the oil sands industry has already led to definitive methods for the design of new plants and to fundamental insights into the behaviour of flowing fluids, particles and colloids.

Syncrude's sponsorship of the chair derives from the company's need to strengthen its scientific and engineering capabilities, and develop a reservoir of technically trained people it can draw upon in the future. Syncrude produces about 12 percent of Canada's petroleum requirements, making it the nation's largest single source of crude oil and the second largest producer in Canada.

Ocean technology industry flourishes in Halifax

A partnership between NSERC and Halifax-based Satlantic Inc. has resulted in an investment of more than $3.1 million to support ocean research at Dalhousie University. The initiative involves the creation of two NSERC industrial research chairs at the university. Dr. John Cullen, formerly with the Bigelow Laboratory in Ocean Science in Maine, takes up the research chair in environmental observational technology. Dr. Alex Hay, formerly at Memorial University of Newfoundland, has been appointed to the chair in ocean acoustical technology. In-kind support to this chair will be provided by the Defence Research Establishment Atlantic (DREA), which will allow

the chairholder access to experimental facilities and research vessels.

Satlantic is a small Canadian company focusing on remote observation of optical properties in the marine environment. Dr. Marlon Lewis, CEO of Satlantic and a professor at Dalhousie University, built the company using technology developed with the support of NSERC grants. The company has become a global supplier of high-precision optical oceanographic sensor systems, and a world leader in satellite observation and information technology.

Canada's steel industry to reap major gains from research chair

Dofasco and NSERC are investing $1.5 million to explore new ways of producing high quality steel at lower cost. Gordon Irons, a McMaster professor of materials science and engineering and a world expert in the field of injection metallurgy, has been named to the chair in process metallurgy. The funding will also support a junior professor, a technician, four graduate students and two postdoctoral fellows, as well as provide for the addition of state-of-the-art equipment. According to Dr. Irons, steel will remain one of the most important industrial materials as we move into the 21st century, and this initiative will ensure that highly skilled engineers are there to run the steel companies of the future.

McMaster has a long history of collaboration with Hamilton's steelmaking industry, and its materials science and engineering department is among the top in North America. The research led by Irons will focus on two specific projects. One is optimizing the efficiency of Dofasco's $200-million electric furnace, the first of its kind to be operated using blast furnace iron. The other will involve enhancing the effectiveness of Dofasco's tank degasser, which produces ultra-low carbon grades of steel for the auto industry.

Correction

Our apologies to Dr. John Robinson, whose last name was incorrectly reported in a "Research Update" article in our summer issue. Dr. Robinson holds the new Chair in Telecommunications Engineering and Information Technology at Memorial University of Newfoundland.

Thank you!

They're just two small words, but they can be tremendously important to the recipient. Recognizing this, and following up on a suggestion from Dr. Chris Smart of the Geography Department at the University of Western Ontario, NSERC created the "Friend of NSERC" certificate in spring 1990 as a means of formally thanking members of the general public who have helped researchers to carry out their NSERC-funded

research.

Although many of you are well aware of the existence of this 'award,' new researchers probably aren't, so every year about this time we place a reminder in Contact. Now, more than ever before, when the research enterprise is in need of public support, it is particularly important for researchers to take the time to communicate with the public and in doing so, help to build support for research sponsored by NSERC.

Does the following sound familiar? You are indebted to a particular individual or group whose local knowledge or logistic assistance helped reduce the cost of your NSERC-funded research and make it more productive. You've been meaning to thank them formally, but haven't got around to it yet. If this applies to you, just let us know about it and we'll be pleased to do it for you. If you are funded by NSERC in any capacity, you may nominate private citizens who have provided assistance, or material or logistic support (note: the intent is not to recognize personal acts of kindness and courtesy that is left to the individual who experienced them.) For example:

- A biology professor at the University of Saskatchewan nominated several individuals who had made unsolicited donations to his research following a series of public lectures he gave in conjunction with his field research. In requesting they be recognized by NSERC, he stated "As costs for conducting research in the North rise and traditional funding sources for academics become more limited, public donations may become increasingly important."
- An assistant professor of physics at the University of New Brunswick nominated a company for loaning him equipment worth almost $200,000 for which, as a new faculty member, he would have had a difficult time raising the funds to buy.
- An associate professor of biology at the University of Regina nominated a security officer. Stationed near the university's Biology Field station, which is in a remote location, the nominee had proven to be very helpful as well as important from a safety and security perspective for the graduate students working there.

If you would like to nominate an individual or group, send us a note including details of how they helped you as well as their name and mailing address, and we'll send them a "Friend of NSERC" certificate thanking them on your behalf and NSERC's for their help. Address nominations to: Friends of NSERC, Communications Division, NSERC, Ottawa, Ontario K1A 1H5, Fax: (613) 943-0742, E-mail: comm@nserc.ca

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The Gateway to Unique Technological Information

Is it worth pursuing research and development (R&D) in a specific area? Is there a technology or product that could offer appropriate

solutions via licensing? Are there business opportunities to improve upon existing technologies?

The "Canadian Patent Database," produced by the Canadian Intellectual Property Office (CIPO) and available on the Internet, can get you started on the road to finding answers to these questions and more! This database provides a snapshot of patented technologies from around the world dating back to October 1, 1989, and also permits competitive watch and product licensing opportunities. CIPO aims to develop this database even further into an advanced research information tool, based on client consultation and user feedback.

The database is accessible free of charge to all Canadians on Strategis or via CIPO's web site. For more information, contact Richard Leclerc at (819) 997-2086.

Credit Where Credit Is Due

> *The Natural Sciences and Engineering Research Council is a familiar name to regular readers of Contact. This is far from the case for those outside the science and engineering research community, however. Even other agencies of the federal government have limited awareness of NSERC's existence and purpose.*

This can lead to misunderstandings about our mission, and incorrect assumptions about the purposes to which our funding is put -- for example, it is common for those outside the "system" to assume that NSERC funding supports the salaries of university researchers, or that grants go into the pockets of faculty members, rather than directly to their research.

NSERC is working hard to improve this situation, notably by providing relevant information to officials of the Treasury Board Secretariat and the Department of Finance at every opportunity. As Contact's readers are aware, NSERC's budget has been cut in recent years. We have therefore a strong incentive to ensure that the information going into the budget process is accurate, showing the true importance of university research and training for Canada.

We also need your help in this: it's important for those receiving NSERC support to give the Council credit for the research funding or scholarships it provides. This includes mentioning our assistance in publications, in conference presentations, in any contacts you might have with the media, and so on. Raising the Council's profile "out there" is an important part of building support for science and engineering research within the federal bureaucracy.

Nationwide Search for Innovators

The Ernest C. Manning Awards Foundation, a not-for-profit organization striving to stimulate and encourage world-class Canadian innovation, is seeking nominations for its 1997 competition.

The $100,000 Principal Award, the $25,000 Award of Distinction and two $5,000 Innovation Awards will be presented to Canadians who have conceived and developed new concepts, procedures, processes or products of benefit to Canada. *(Editor's note: The 1996 winner of the Principal Award is Simon Fraser University lab engineer Tim Collings, for developing the V-Chip, a simple mechanism for parents to control what their children watch on television. Congratulations, Tim.)*

To receive a nomination pamphlet or for more information, visit the Foundation's Internet site at http://www.manningawards.ca, or contact: The Manning Awards, 3900, 421-7th Avenue S.W., Calgary, Alberta T2P 4K9, Tel.: (403) 266-7571, Fax: (403) 266-8154.

Nominations close on February 15 or, if that date falls on a weekend, the following business day.

Launch of On-Line List of UBC Technologies

The University-Industry Liaison Office (UILO) of the University of British Columbia recently announced the launch of its on-line search version of the UBC List of Technologies, now available through the World Wide Web.

Believed to be the first of its kind in North America, this on-line service provides industry, government, university and other users with up-to-date and direct access to the UILO's technology database. In total, UBC has a pool of over 400 technologies that are either available for licensing, collaborative R&D, or joint development with an existing licence or option holder.

To conduct an on-line search, visit the UILO's Web site at www.uilo.ubc.ca. From the table of contents, choose "On-Line Search of UBC List of Technologies."

For more information, contact Mercedes Ratzinger, Tel.: (604) 822-6484; E-mail: mr@orsil.ubc.ca.